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### (54) Carton for packaged articles

(57) A carton (10) for containing a plurality of similarly-shaped packages (40), particularly battery packages, comprises a box-like structure in which the packages are arranged in two stacks with their end portions (41) interleaved at a central region, the side walls and upper wall of the carton (15,16,12) being provided with means, for example, a tear-off strip (50), at the cen-

tral region to facilitate separating the carton into two parts, each containing a respective stack, and the lower wall (14) being adapted to hinge around a transverse axis (30) to allow the two parts to be rotated. When rotated, the end portions (41) of the packages become exposed and are aligned in a row for easy transfer to a display hanger.

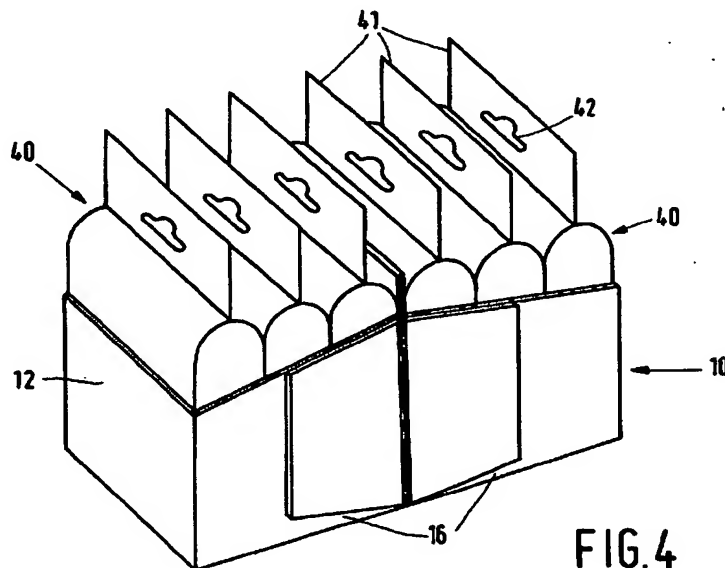


FIG. 4

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## Description

This invention relates to cartons for containing a plurality of similarly-shaped packages. The invention is concerned particularly, although not exclusively, with cartons for containing battery packages.

Batteries are commonly provided in display packages containing, for example, one to four or possibly more individual batteries depending on the type and size of the battery. These display packages are supplied to distributors, retail outlets or the like in cartons in the form of simple box type cartons containing, for example, twelve battery packages and sufficiently sturdy to support and protect the battery packages during shipping. The packages are usually of the blister kind having a card or paper backing and in order to save space are often layered in the carton in top to tail fashion with the packages in one layer being inverted with respect to the packages in an adjacent layer. At the retail outlet the battery packages have to be removed individually by hand from the carton and transferred to a display rack, usually consisting of hangers onto which the battery packages are loaded.

It is an object of the present invention to provide an improved carton suitable for such purposes.

According to the present invention there is provided a carton comprising an upper wall, a lower wall, two side walls and two end walls defining a box-like structure containing a plurality of similarly shaped packages, each package holding one or more articles and having a flexible end portion of reduced thickness extending away from the article, the packages being arranged in the carton in two stacks with the end portions of the packages in one stack being interleaved with the end portions of the packages in the other stack at a central region of the carton, the upper and side walls having at least one line of weakness extending therearound at said region to facilitate separation of the carton into two parts, and the lower wall being adapted to hinge around an axis extending transversely of the lower wall at said region to allow the two parts, each holding a respective stack of packages, to be rotated relative to one another around said axis upon separating the upper and side walls thereby to expose the end portions of the packages.

The lower wall is preferably adapted to hinge by means of a fold line, for example a crease or a score line, extending transversely of the lower wall. This fold line may be defined by perforations in order to allow the two parts of the carton to be completely separated from one another in convenient fashion if desired.

The upper and side walls may have a single, continuous, line of weakness extending therearound to facilitate separation of the carton into two parts. A tear tape may be used in conjunction with this line.

Preferably, however, for ease of use, the upper and side walls of the carton have two lines of weakness extending thereover alongside one another which define a tear-off strip extending around said region. These lines of weakness preferably extend completely over the side

and upper walls, such that they terminate at the junctions between the side walls and the lower wall, with respective ends of the two lines being spaced from, and to either side of, the hinge axis.

The carton of the invention offers a number of significant advantages over the simple box used heretofore. Firstly, because the packages are arranged within the carton in two stacks with their end portions interleaved, their combined volume is less than that occupied by the same number of packages arranged side by side in one stack or top to tail in layers. Thus, greater packing density is achieved. Secondly, and importantly, when the carton is opened at the retail outlet by separating and pivoting the two parts, the end portions of the packages in one stack are parted from the end portions of the packages in the other stack. When fully pivoted, with the portions of the bottom wall to either side of the hinge axis overlying one another, the two stacks of packages are supported in two separate compartments then formed by the two parts of the carton to either side of the hinge, with the end walls of the carton respectively becoming the bottoms of the two compartments, each supporting a stack, and with the end portions of the packages in both stacks being neatly aligned in a row and projecting out of the two compartments. This greatly facilitates the transfer of the packages to a display rack at the retail out. It is not necessary to manually remove the packages individually from the carton. Instead, the carton can simply be offered up to the hanger of the rack and manoeuvred so that the hanger passes through openings or the like provided in the end portions and then removed to leave the packages hanging upon the hanger. Packages such as battery packages conventionally are provided with such openings for use with display pack hangers. Rather than having openings, however, the end portions of the packages may be suitably shaped, for example, in the form of a hook which cooperates with a hanger to the same end.

The use of perforations to define the hinge axis enables the two portions of the bottom wall to either side of the hinge axis to be detached readily from one another in order to separate completely the two compartments of the carton. This is advantageous when all the packages in the carton are not required to be transferred to the display rack at the same time. The packages in one compartment can be stored away after detaching the two compartments until such time as they are needed, thus avoiding unnecessary wastage of shelf space.

According to another aspect of the invention there is provided a carton for containing a plurality of similarly-shaped packages which comprises a box-like structure having upper and lower walls, two side walls and two end walls defining an interior for accommodating the packages, the carton having at least one line of weakness extending from adjacent one side of the lower wall over the side walls and upper wall to adjacent the other side of the lower wall at a central region of the carton to enable the portions of the side walls and upper wall to either side of the line of weakness to be separated from one another

and dividing the carton into two parts, and in which the lower wall has a line of weakness extending transversely at the central region which defines a hinge axis about which the one part can be rotated relative to the other part to bring the two portions of the lower wall to either side of the hinge axis side by side.

Preferably the carton has two lines of weakness extending alongside one another over the side walls and upper wall at the central region which define a tear-off strip extending from adjacent one side of the lower wall to adjacent the opposite side of the lower wall, and each end of the tear off strip preferably extends to either side of the hinge axis.

The line of weakness extending across the lower wall may be defined by perforations to enable the two parts of the carton readily to be separated from one another completely if desired.

The carton is preferably formed from a single blank which may, for example, be of corrugated cardboard, plain card or other suitable material.

Although intended primarily for use with battery packages the carton can, of course, be used for containing other articles in appropriate forms of packages having end portions capable of being interleaved and of adequate flexibility.

A carton according to the present invention, and a carton containing packages, in particular battery packages, will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of the carton before opening;

Figure 2 is a plan view of a blank from which the carton is formed;

Figure 3 is a perspective view of the carton and battery packages illustrating the manner in which the battery packages are disposed in the carton; and

Figure 4 is a perspective side view of the carton after opening.

Referring to Figure 1, the carton, referenced generally at 10, comprises a rectangular box-like structure formed of corrugated cardboard and having top and bottoms walls, 12 and 14, side walls, 15 and 16, and end walls 17 and 18.

The carton is formed from a single blank which is illustrated in plan view in Figure 2. A single piece of cardboard is cut to define a central rectangular area having transverse fold lines which serve to define respective rectangular panels constituting the top and bottoms wall, 12 and 14, of substantially equal size and the side walls, 15 and 16, again of substantially equal size, as shown. Connected to the panels 15 and 16 by fold lines defining opposing edges of the panels 15 and 16 are outwardly projecting rectangular flap portions 19 and 20 and 21 and 22 respectively whose combined lengths are approximately equal to the width of the panels 12 and 14 and which, when folded, form elements of the end walls 17 and 18. Similarly, projecting outwardly from the sides of

the panels 12 and 14 and connected thereto by fold lines, are tapered flap portions 23 and 24 and 25 and 26 respectively, whose combined lengths are slightly less than the height of the panels 12 and 14 and which, when folded, constitute outer elements of the end walls 17 and 18. Joined to the panel 12 along a fold line is a closure flap portion 27 whose width is approximately half that of the side wall panels 15 and 16. When folded this flap overlies the upper half of the side wall 16 of the structure.

Hot melt adhesive is applied to the flap portions 23, 24, 25, 26 and 27 so that, after the blank is folded into the box-like structure as shown in Figure 1, the flap portions 23 and 24 adhere to the upper parts of the flap portions 19 and 21 and 20 and 22 respectively, the flap portions 25 and 26 adhere to the lower parts of the flap portions 19 and 21 and 20 and 22 respectively to form the end walls 17 and 18, and the flap portion 27 adheres to the upper half of the panel 16 so as to secure the structure.

Referring again to Figure 2, the blank is provided also with a line of weakness 30 comprising a fold line formed as a crease or score line extending transversely across the bottom wall panel 14 approximately mid-way along the length of the panel, and two pairs of lines of spaced cuts, referenced at 32 to 35, produced by a zipper rule, the lines 32 and 33 of one pair extending alongside one another completely over the panels 15 and 12 and the flap portion 27 and the lines 34 and 35 of the other pair extending alongside one another completely over the panel 16 as shown, whose purposes will be explained.

The panel 12 of the enclosed carton forms the lid of the box-like structure and, as shown in Figure 3, before this panel is secured over the side and end walls of the structure by gluing the flaps 23, 24 and 27, the battery packages, 40, are introduced. In the particular embodiment shown in Figure 3, only six battery packages are provided. However, it will be appreciated that the number of packages accommodated in the carton can be increased as desired by changing the dimensions of the carton appropriately. It will also be appreciated that the size and shape of the individual packages will depend on the type of battery and the number of batteries contained in each package which can be varied. The example packages shown in Figure 3 represent a standard type of multi-pack containing four "AA" size batteries, this size of multi-pack being widely used. The batteries are contained in the package in side-by-side relationship and the package has a comparatively thin end portion in the form of a flexible flap, indicated at 41, by which the package is intended to be supported on a display rack, the flap 41 being provided with a suitable opening or slot 42 through which a hanger of the display rack can extend.

As illustrated in Figure 3, the battery packages are placed in the carton in two stacks of three packages with the end portions 41 of the packages of one stack being interleaved with the end portions 41 of the packages of the other stack. The packages may be interleaved in this manner before placing the two stacks in the carton or,

alternatively, the two stacks may be built up in the carton by placing a package in each stack alternately. The size of the carton is such that the two stacks are tightly confined in its interior, the length of the carton being significantly less than twice the length of an individual battery package because of the interleaving. After placing the packages in the carton, the carton is closed and secured by gluing down the flap portions 23, 24 and 27 (Figure 1) where they overlie the flaps 19 and 21, 20 and 22 and the panel 16 respectively, the carton then providing a sturdy and compact container in which to transport the battery packages.

In the assembled carton, the lines of cuts 34 and 35 overlie the lines of cuts 32 and 33 respectively where the flap 27 overlaps the side wall panel 16 and together these lines define a perforated tear-off strip 50 which extends continuously around the central region of the carton, surrounding the interleaved end portions of the packages, from adjacent one side of the bottom wall 14 over the side wall 16, the top wall 12 and the side wall 15 to adjacent the other, opposing, side of the bottom wall 14. The lines of cuts defining the tear strip 50 terminate at the fold lines at the junction between the bottom wall 14 from the side walls 15 and 16 a short distance to either side of the fold line 30 across the centre of the bottom wall 14. Slots are cut in the cardboard along the fold lines at both sides of the panel 14 between the ends of the lines of cuts as shown at 28 in Figures 1 and 2 to allow a person to grip and remove the tear-off strip 50 when opening the carton.

By removing the tear-off strip 50, the carton is divided into two parts joined together still by the bottom wall 14. The two parts are then rotated relative to one another through ninety degrees around a pivot axis constituted by the fold line 30, which acts as a hinge for this purpose, until the two halves of the bottom wall 14 overlie one another. Upon so doing, the end portions 41 of the battery packages in one stack are parted from those in the other stack and the battery packages of both stacks are aligned neatly in a row, as shown in Figure 4. In this pivoted state the two parts of the carton provide respective compartments which each contain the battery packages of one stack, with the end walls 17 and 18 of the carton becoming the bases of the two compartments.

The battery packages can then be simply and conveniently transferred to a hanger of a display rack by simply offering up the carton and aligning the end of the hanger with the opening 42 in the battery package 40 at one end of the row and moving the carton so that the hanger passes through the openings in all the battery packages. The carton is then withdrawn downwardly, leaving the battery packages suspended on the hanger.

It may be that just a few of the battery packs need to be transferred to top up packages already on the hanger. In this case, the contents of just one compartment, i.e. the battery packages of one stack, can be transferred and the remaining packages retained in the carton for later use. Preferably then the two parts of the carton are completely detached by tearing along the fold line 30

so that the empty compartment can be discarded and the part containing the remaining packages stored without unnecessary wastage of shelf space. To facilitate such separation, the fold line 30 may be defined by perforations or the like.

It will be appreciated that the number of battery packages contained in the carton can be varied by appropriately sizing the dimensions of the carton to accept stacks consisting of more than three packages. The shape and dimensions of the carton can also be suitably aligned to accept battery packages containing different types of battery in different quantities.

The form of the battery package can also be varied. The end portion of the package, however, should not be too stiff but should be adequately flexible to permit the required interleaving and allow the packages in the two stacks to become separated when the two stacks are rotated relative to one another upon pivoting the parts of the carton around the hinge 30. The particular form of package illustrated in the drawings, has an end portion which projects outwardly from the central plane of the portion in which the batteries are enclosed side by side. The package material may be plastics foil or a plastics coated paper. An alternative form of package which would be suitable and which has been commonly used consists of a planar sheet of flexible plastics material having a moulded recess in which the batteries are located side by side and a sheet of paper extending over the rear side of the plastics sheet and closing the recess.

Instead of having a tear strip 50, the carton may have a single line of weakness, formed by perforations or cuts, extending continuously over the side and upper walls at the central region to facilitate the separation of the carton into two parts. This single line of weakness may be used in conjunction with a tear tape.

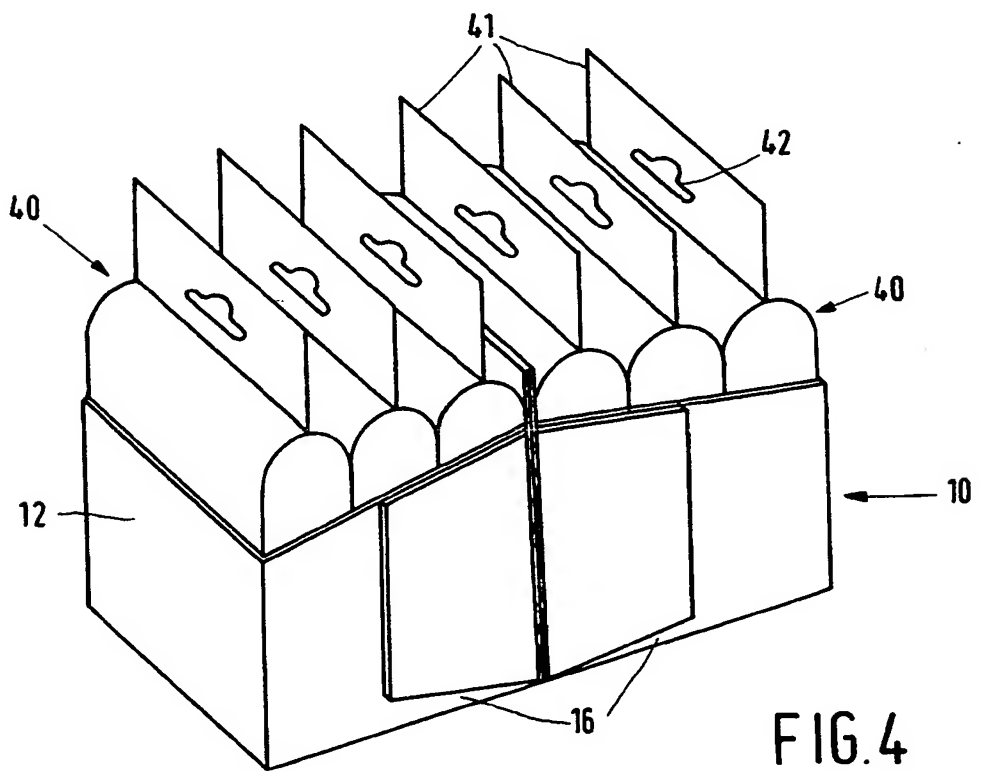
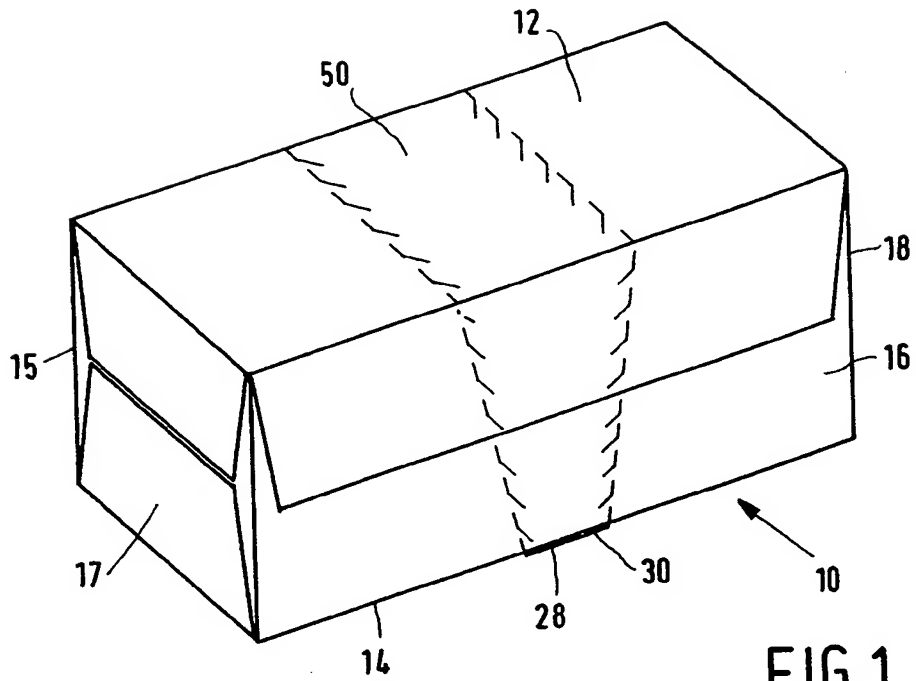
Although the above described embodiment of carton contains just two stacks of packages, more than two stacks could be accommodated by suitably increasing the width of the carton such that pairs of stacks are arranged side by side between the side walls 15 and 16 with the packages of each pair of stacks being interleaved at the central region. When opened, the packages of each pair of stacks are aligned in respective, parallel, rows. In this way, four, six or even more stacks can be accommodated if desired.

The carton can, of course, be used for packages containing products other than batteries providing such packages are of a generally similar form having a region in which the articles are accommodated and a flexible end portion extending away from that region.

From reading the present disclosure, other variations and modifications will be apparent to persons skilled in the art. Such variations and modifications may involve equivalent and other features which are already known in cartons for containing packages and component parts thereof and which may be used instead of or in addition to features already described herein.

## Claims

1. A carton comprising an upper wall, a lower wall, two side walls and two end walls defining a box-like structure containing a plurality of similarly shaped packages, each package holding one or more articles and having a flexible end portion of reduced thickness extending away from the article, the packages being arranged in the carton in two stacks with the end portions of the packages in one stack being interleaved with the end portions of the packages in the other stack at a central region of the carton, the upper and side walls having at least one line of weakness extending therearound at said region to facilitate separation of the carton into two parts, and the lower wall being adapted to hinge around an axis extending transversely of the lower wall at said region to allow the two parts, each holding a respective stack of packages, to be rotated relative to one another around said axis upon separating the upper and side walls thereby to expose the end portions of the packages. 5
2. A carton according to Claim 1, characterised in that the lower wall is adapted to hinge by means of a fold line extending transversely thereof. 10
3. A carton according to Claim 1 or Claim 2, characterised in that the carton includes two lines of weakness extending alongside one another over the side walls and upper wall at the central region which define a tear-off strip. 15
4. A carton according to Claim 3, characterised in that the two lines of weakness defining the tear-off strip extend completely over the side walls and the upper wall and terminate respectively to either side of the hinge axis. 20
5. A carton according to any one of Claims 1 to 4, characterised in that the carton is formed from a single blank. 25
6. A carton according to any one of Claims 1 to 5, characterised in that the packages comprise battery packages. 30
7. A carton for containing a plurality of similarly-shaped packages which comprises a box-like structure having upper and lower walls, two side walls and two end walls defining an interior for accommodating the packages, the carton having at least one line of weakness extending from adjacent one side of the lower wall over the side walls and upper wall to adjacent the other side of the lower wall at a central region of the carton to enable the portions of the side walls and upper wall to either side of the line of weakness to be separated from one another and dividing the carton into two parts, and in which the lower wall has a line of weakness extending transversely at the central region which defines a hinge axis about which the one part can be rotated relative to the other part to bring the two portions of the lower wall to either side of the hinge axis side by side. 35
8. A carton according to Claim 7, characterised in that two lines of weakness are provided which extend alongside one another over the side walls and the upper wall at the central region and define a tear-off strip. 40
9. A carton according to Claim 8, characterised in that the tear-off strip defined by the lines of weakness extends from adjacent one side of the lower wall to adjacent the opposite side of the lower wall with each end of the tear-off strip extending to either side of the hinge axis. 45



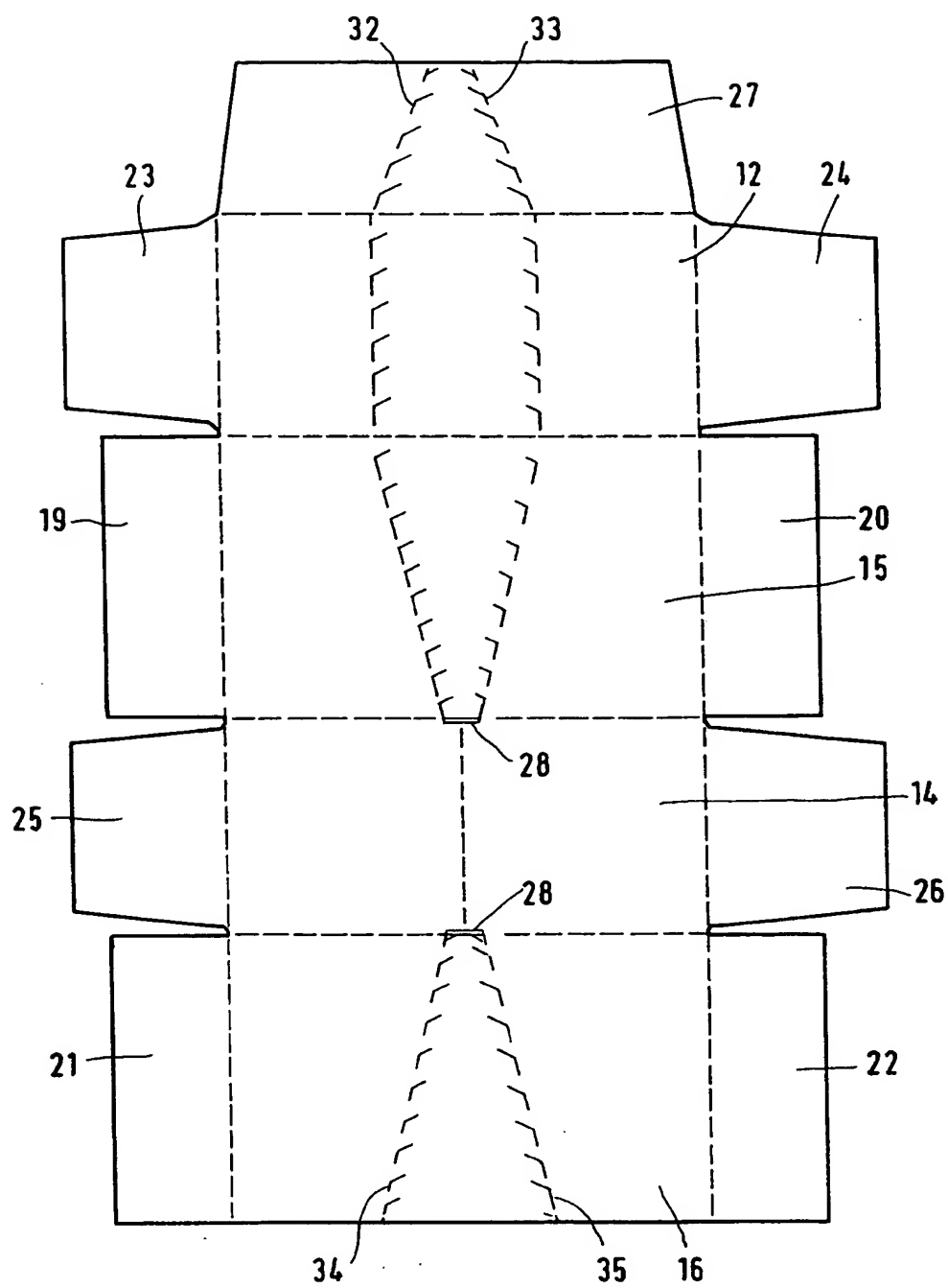


FIG. 2

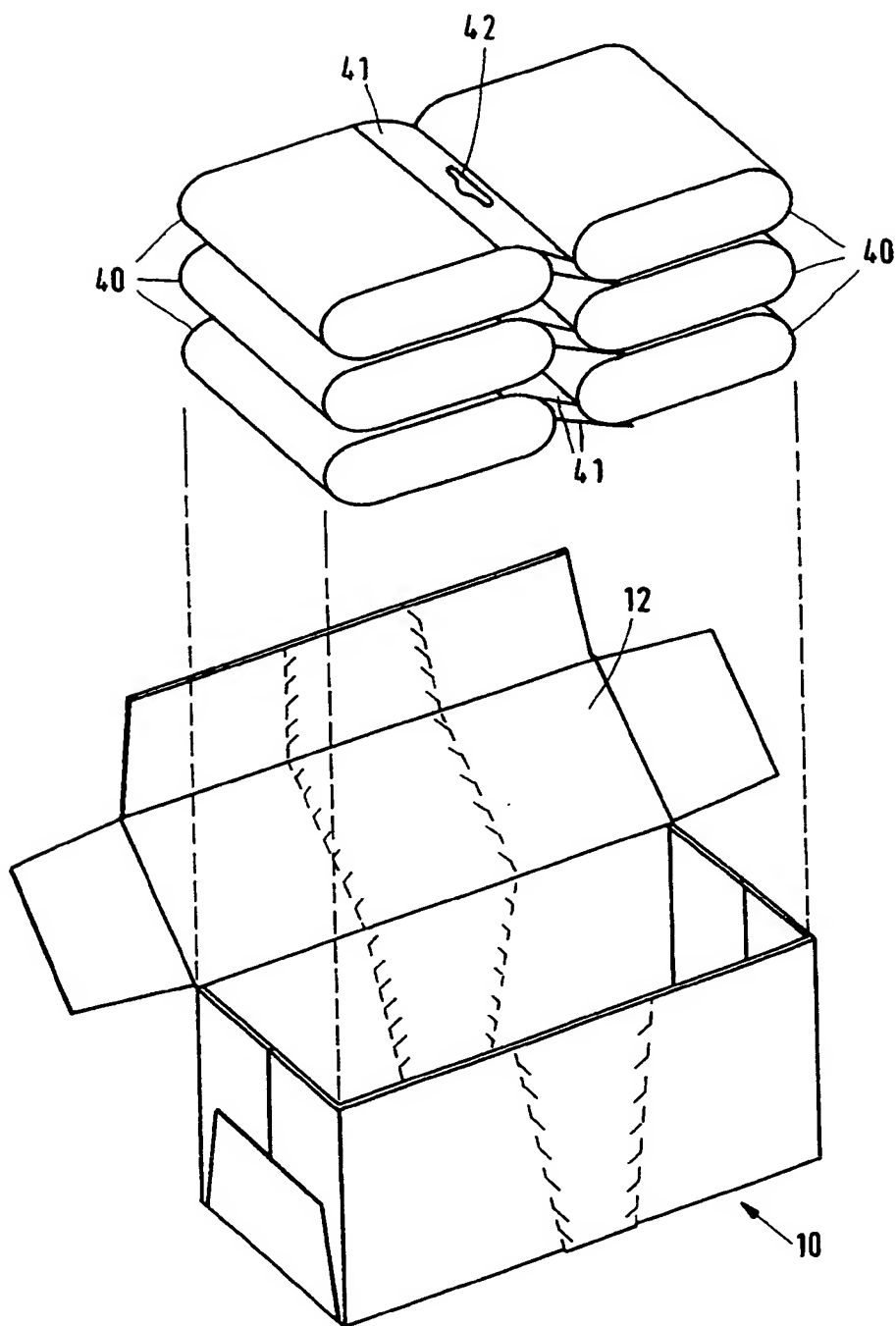


FIG. 3





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# EUROPEAN SEARCH REPORT

Application Number  
EP 95 20 2329

| DOCUMENTS CONSIDERED TO BE RELEVANT  |   |  |  |
|--|---|--|--|
| Category   | Citation of document with indication, where appropriate, of relevant passages                                       | Relevant to claim                                    | CLASSIFICATION OF THE APPLICATION (Int.CL.6) |
| X  | FR-A-2 669 893 (SOCAR)<br>* the whole document *  | 1-9  | B65D83/00<br>B65D5/54                        |
| X  | LU-A-67 473 (N.V. PAPIERFABRIEK "DE HOOP"<br>BOS EN ZONEN)<br>* page 3, line 29 - page 5, line 35;<br>figures 1-4 * | 1-9  |  |
|  |   |  | TECHNICAL FIELDS<br>SEARCHED (Int.CL.6)      |
|  |   |  | B65D   |
| The present search report has been drawn up for all claims   |   |  |  |
| Place of search<br>THE HAGUE   |   | Date of completion of the search<br>22 December 1995 | Examiner<br>Martens, L                       |
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